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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/750,576	12/28/2000	Heu-Gon Kim	5000-1-181	6522
33942	7590	08/26/2004	EXAMINER	
CHA & REITER, LLC 210 ROUTE 4 EAST STE 103 PARAMUS, NJ 07652			CHANG, AUDREY Y	
			ART UNIT	PAPER NUMBER
			2872	

DATE MAILED: 08/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/750,576

Applicant(s)

KIM ET AL.

Examiner

Audrey Y. Chang

Art Unit

2872

AC

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- 1) ☐ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Remark

- This Office Action is in response to applicant's amendment filed on June 14, 2004, which has been entered into the file.
- By this amendment, the applicant has amended the claims 15, 16 and 19.
- Claims 8-19 remain pending in this application.
- The objection to the specification set forth in the previous Office Action is withdrawn in response to applicant's amendment to the specification.

Response to Amendment

1. The amendment filed on June 14, 2004 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: **claims 15 and 19 have been amended** to include the feature "a width of each of said slits is greater than any wavelength of said light so that said light is not diffracted upon passing through said slits". The specification only give support for the width of the slits to be greater than the wavelength but **DOES NOT** give support for the light not being diffracted by the slits. The applicant is respectfully reminded by the diffraction theory; this condition actually will allow the light being diffracted by the slits as it passes it through. Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it

Art Unit: 2872

pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. **Claims 14 and 16-19 are rejected under 35 U.S.C. 112, first paragraph**, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The same rejection has been stated in the previous Office Action.

The specification fails to teach how could the inner walls of the slits (of the amplitude pattern) rectify the beam into parallelism, since the collimation (or parallelism) is achieved by the plurality of lenses not by the amplitude mask. The transparent regions will simply pass the collimated light beam. If the non-collimated light beam strikes the inner walls of the slits, it will be deflected to generally non-collimated direction.

The specification and the claims fail to teach how could the **width of the mask be adjusted** since a mask has fixed slit pattern therefore fixed width defined by the slit pattern. It is not clear how to physically “adjust” the width of the slit pattern. Claims 17-19 inherit the rejection from their based claim.

In response to applicant’s arguments, the applicant is respectfully reminded:

(1). Claim 14 specifically states, “the updating step further rectifying said beams into parallelism **with said inner walls**”. If the limitation concerning “rectifying the beam into parallelism” involves **ONLY** the “updating step” and **NOT** the “inner walls” then such phrase needs to be amended. Currently the phrase suggests and states that the rectifying light beam into parallelism is achieved **with the inner walls**.

(2). The specification (page 12 line 21 to page 13 line 2) teaches about adjusting the **thickness** but **not width** of the amplitude mask. Thickness of the amplitude mask is **different** from the width.

The reasons for rejection, with regard to claim 15 and 19, based on newly added matters are set forth in the paragraph above.

Claim Objections

4. Claims 8-19 are objected to because of the following informalities:

(1). It is not clear how does the “grating pattern” recited in claims 8 and 16 relate to the fabrication of the optical fiber grating. If the grating pattern is intended to be recorded in the optical fiber as the fiber grating then such link should be positively identified.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 8-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Bhatia et al (PN. 6,694,075) in view of the patent issued to Bruesselbach (PN. 5,604,829).

The same reasons for rejection are set forth in the previous Office Action and repeated as follows.

Bhatia et al teaches a method for making apodization fiber grating in a waveguide, which can take the form as optical fiber (110, Figure 6, column 7, line 32-33), wherein the method comprises the step of providing an optical *waveguide* (or *fiber*), a *light source* (92), which may be a *excimer* laser light source having *ultraviolet* wavelength, a *plurality of lenses* (96 and 102), and an *amplitude mask* (112), (Bhatia et al teaches *explicitly* that an amplitude mask may be used to write the fiber grating, please see column 3, lines 35-40). The amplitude mask necessarily has a *slit pattern*, which has certain *width* and

Art Unit: 2872

spacing. Bhatia et al teaches that the plurality of lenses is positioned to provide *collimated* light beam, (i.e. parallel with respect to the optical axis) which travels through the amplitude mask to produce a grating pattern on the waveguide or optical fiber. The fiber grating has a grating pattern that is *conformed* with the slit pattern of the amplitude mask since the amplitude mask is used to expose and to produce the grating pattern. It is implicitly true that the positions of the light source, the plurality of lenses, the mask and the optical fiber are adjusted so that the grating pattern produced by the amplitude mask is formed, and conforms, to the slit pattern of the amplitude mask.

This reference has met all the limitations of the claims with the exception that it does not teach explicitly that the light source and the plurality of lenses are aligned with the amplitude mask and the fiber along an optical axis. However such modification is rather well known in the art as demonstrated by the teachings of **Bruesselbach** in writing a fiber grating using UV laser source through amplitude mask, wherein the light source and lenses are aligned with the mask and optical fiber along an optical axis, (please see Figure 1). It would then have been obvious to one skilled in the art to modify the arrangement of Bhatia et al accordingly for the benefit of providing an alternative and compact arrangement for writing the fiber grating.

With regard to claims 9-11, it is implicitly true that the positions of the lenses are adjusted with respect to each other to obtain the collimated illuminating light beam, as shown in Figure 6. Bhatia teaches that the plurality of lenses includes a convex *cylindrical* lens however it does not teach explicitly that it also includes a concave lens. But since both the lens arrangements achieve the same function, namely collimating the light beam from the light source, to use one arrangement of lens as opposed of the other is considered to be obvious matters of design choices to one skilled in the art.

With regard to claims 12-13 and 17-18, Bhatia et al teaches the light source is an excimer light source generates light of ultraviolet wavelength, (please see column 7, lines 7-10).

Art Unit: 2872

With regard to claims 15 and 19, both references do not teach explicitly the width of the amplitude mask is greater than the wavelength of the light used. However this feature is either inherently met or obvious modification to one skilled in the art since the condition is required for if one wants to expose the mask pattern directly on the fiber grating which is generally the case for ultraviolet lithographic process. **Claims 15 and 19 have been amended** to add the feature that the slits of the amplitude grating does not diffract the light as it pass through it, however such feature is NOT supported by the specification. In fact, by the diffraction theory or diffraction equation: $a \sin \theta = m \lambda$, with a being the width of the slits, angle θ being the angle between the optical path (from one slit) with respect to the normal or central peak, m being the integer and λ being the wavelength, one skilled in the art would know that for the condition that width a be **greater** than the wavelength λ , the diffraction condition will actually be satisfied, that is to say the condition will actually allow the light to be diffracted by the slits.

Response to Arguments

7. Applicant's arguments filed on June 14, 2004 have been fully considered but they are not persuasive. The newly amended claims have been fully considered and they are rejected for the reasons stated above.
8. Applicant's arguments concerning the new matters rejections to claims 14 and 16 have been fully addressed in the paragraphs above.
9. In respond to applicant's arguments concerning the objection to claims 8 and 16, the applicant is respectfully reminded if the "grating pattern" is the same as the "apodized optical fiber grating" such identification needs to be positively state in the claims. The claims were NOT rejected under 35 USC 112, second paragraph; applicant's arguments concerning such therefore are irrelevant.
10. In response to applicant's arguments which state that the cited Bhatia et al teaches a collimator to collimate light beam (collimate means parallelism) but does not teach "updating said position so as to

Art Unit: 2872

rectify said beams into parallelism with said optical axis” which therefore differs from the instant application, the examiner respectfully disagrees for the reasons stated below. Firstly, it is well known in the art that the rectification of light into parallelism **IS NOT** by “updating positioning” (by the way updating positioning of what?), but by having the **optical element** (such as collimator) being placed at proper position in relating to light source and other optical elements to make the light collimated or in parallelism. That is to say it is the **optical collimator** that causes collimation of the light but NOT the step of “updating positioning”. In Figure 6 of the instant application, the applicant teaches a *collimator* (32) with two optical elements (34 and 35), and the collimation of the light is achieved by keeping the two optical elements (34 and 35) at proper position. Bhatia et al teaches to use a collimator (102, Figure 6), to collimate the light. It is known in the art that the collimator has to be positioned at the focal length of the collimator with respect to the pinhole (100) in order for the collimation to be achieved, the updating positioning step, which positioning the collimator at proper location therefore is implicitly included in the disclosure of Bhatia. The applicant is respectfully reminded that the illumination of the collimated light will impose the slit pattern on the fiber to form the grating pattern, which certainly will make the two conformed to each other.

11. In response to applicant’s argument, which states that the cited Bhatia reference does not teach to adjust the **width** of the mask however the specification of the instant application also **fails** to give support and disclose such feature.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

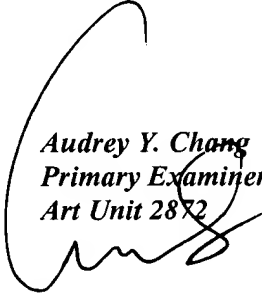
Art Unit: 2872

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Audrey Y. Chang
Primary Examiner
Art Unit 2872

A. Chang, Ph.D.